



## Central District Office

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Chris Korleski, Director

Air Land Water Pollution Prevention Public

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## Division of Emergency and Remedial Response Site Cleanup Summary

### NEWARK PROCESSING

#### Background

Newark Processing was a secondary aluminum recycling facility. In 1980, they began operations at the 66-acre East Main Street facility adjacent to the Licking River. They ceased operations in late 1996 due to bankruptcy.

Newark Processing processed aluminum dross, which is a by-product of primary and secondary aluminum smelting. Dross consists of varying concentrations of aluminum, aluminum oxides, free metals, and salts. They received the dross from several aluminum smelting companies and processed it on a tolling basis.

Newark Processing received two types of dross: (1) white dross, which contained a high enough aluminum content to be fed directly into a rotary furnace for smelting, and (2) black dross, which needed to be processed through a wet mill to concentrate aluminum before smelting. Both the furnaces and wet mill generated by-products (saltcake and dross fines, respectively) that were stockpiled on-site. The by-product from the wet mill was screened by size, and the larger particles were recovered and reprocessed. The smaller particles flowed to a series of cement-lined settling ponds. The sludge that accumulated in these ponds was called "dross fines." The dross fines that accumulated in the settling ponds were periodically removed and stockpiled on-site. Newark Processing claimed that the dross fines would either be re-processed or sold.

At the time of its bankruptcy, Newark Processing estimated that approximately 374,000 tons of dross fines and 175,000 tons of aluminum dross remained on-site.

#### Regulatory Status

Several efforts were made in the 1980s to determine the regulatory status of the material on the site. On September 16, 1980, Newark Processing applied for a Part A permit under the Resource Conservation and Recovery Act (RCRA) because of uncertainty regarding its status under federal law; however, on September 13, 1982, it withdrew the Part A permit application. On April 1, 1985, Ohio EPA Division of Solid and Hazardous Waste Management (DSHWM) re-evaluated the federal regulatory status of the material. DSHWM determined that incoming dross was not regulated under RCRA, and the dross fines were not regulated under solid waste regulations because Newark Processing intended to recycle or reuse it.

On May 13, 1986, Ohio EPA Division of Water Pollution Control informed Newark Processing that it had violated water pollution regulations. On June 6, 1988, Ohio EPA issued Director's Orders (DFF&Os) to Newark Processing for these violations. The DFF&Os found that wastewater was being discharged to an impoundment, bypassing the enclosed recycling pits; (2) the recycle pits were overflowing; (3) aluminum oxide (i.e., dross and dross fines) was stockpiled that contained aluminum nitride, which hydrolyzes in water to create ammonia leachate outbreaks were occurring on the bank of the Licking River; and (5) pollutants were discharged to waters of the state without a National Pollution Discharge Elimination System (NPDES) permit.

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# U.S. EPA REGION IV

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permit. The DFFOs required that Newark Processing (1) stop bypassing the settling lagoon; (2) monitor surface water in the Licking River and Shawnee Run; and (3) submit monitoring data to Ohio EPA on a monthly basis. Newark Processing complied with the DFFOs until October 1995 when it ceased operations.

On June 8, 1995, Ohio EPA Division of Surface Water (DSW) inspected the site and found that the Licking River was eroding toward the stockpiled material. They also noted gross sediment in the Licking River. DSW requested that Newark Processing obtain a storm water permit. On June 15, 1995, Ohio EPA issued an NPDES storm water permit to Newark Processing, which expired in April 1996. On April 9, 1996, DSW requested that Newark Processing submit a storm water prevention plan. Newark Processing complied with the request.

On February 24, 1997, Newark Processing informed DSW that it was going to file for bankruptcy. DSW asked Ohio EPA's Division of Solid and Infectious Waste Management (DSIWM) if Newark Processing was subject to solid or hazardous waste regulations because the material was no longer going to be recycled or sold. DSIWM replied that if Newark Processing wanted the stockpiled material, it may be subject to solid or hazardous waste regulation. On April 17, 1997, Newark Processing filed for Chapter 7 bankruptcy.

On November 11, 1997, the AGO filed a claim with the bankruptcy court on behalf of Ohio. On April 17, 2002, the bankruptcy court awarded Ohio EPA approximately \$300,000.

On June 8, 2001, Ohio EPA Division of Emergency and Remedial Response (DERR) inspected the site under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and submitted a pre-CERCLIS screening assessment to U.S. EPA. DERR determined that no further remedial action planned (NFRAP) determination due to a score of less than 100, indicating no observable impacts to potential receptors. U.S. EPA gave Newark Processing a NFRAP determination on June 27, 2001.

**Investigation Summary**

In addition to determining the regulatory status of the site, several attempts were made to characterize the material stockpiled on site.

In 1980, Newark Processing analyzed the material stockpiled on site at the request of Ohio EPA. Metals and ammonia were detected in the sample; however, Ohio EPA concluded that the stockpiled material did not require regulation. On February 28, 1991, Newark Processing analyzed dross fines for total metals, pH, percent solids, and chlorides. Results indicated relatively low metal content with a pH of 9.6; however, no conclusions were drawn from this data. On January 11, 1994, Newark Processing sampled the aluminum dross fines for organics and metals using the Toxicity Characteristic Leaching Procedure (TCLP). All organics were below detection limits. Barium, chromium, lead, and copper were detected, but the concentrations were below the TCLP regulatory limits (the material was not a characteristic hazardous waste). On April 29, 1994, Newark Processing analyzed dross fines for total metals. The results indicated high metal content; however, no conclusions were drawn from this data.

In May 1999, at the request of Ohio EPA through the AGO and bankruptcy court, the Newark Processing bankruptcy trustee contracted URS Greiner Woodward Clyde (URS) to conduct an investigation of the stockpiled material and ground water. URS conducted the investigation from May 10 to May 15, 1999. URS installed eight direct push (Geoprobe™) borings, collected surface and subsurface dross samples, and collected a composite dross sample of the West Dross.

URS analyzed the material for metals. Results indicated high metal content in the waste; however, all concentrations were below the TCLP regulatory limit. High concentrations of ammonia and chloride were detected, and the pH range was 7.9-10.5. URS analyzed the ground water for total and dissolved metals, pH, ammonia, chloride, and fluoride. Ground water samples for arsenic, barium, cadmium, nickel, selenium, and fluoride were above their respective maximum contaminant levels (MCLs) for drinking water. Also, high ammonia and chloride concentrations were detected.

URS stated the following conclusions: (1) the stockpiled material throughout the site v physical and chemical composition; (2) the material was not a characteristic hazardous waste material was not leaching significant concentrations of metals to ground water; waste material could be treated as a solid waste.

In 2004, the city of Newark contracted Civil and Environmental Consultants, Inc. (CEC) Phase II investigation of the property using the \$300,000 in bankruptcy funds that had to Ohio EPA. In addition, Ohio EPA contributed resources (personnel, Geoprobe™, well installation) through a grant from U.S. EPA.

CEC and Ohio EPA collected samples of soil, dross, dross fines, ground water, surface sediment. Ohio EPA also assessed macroinvertebrate communities in the Licking River, Shawnee Run. All environmental media were analyzed for metals, ammonia, nitrate-nitrite, volatile organic compounds and all dross stockpiles were analyzed for dioxins.

The sample results were compared to the Ohio EPA Voluntary Action Program generic standards. The highest contaminant concentrations detected are summarized in Table 1. It was determined that (1) no contaminant detected in soil, dross, or surface water/sediment generic standards; (2) ground water exceeded unrestricted potable use standards for selenium, and nitrate-nitrite; (3) multiple chemical adjustment indicated the dross and property-specific applicable standards for some complete pathways (e.g., direct contact with water and direct contact, inhalation, and ingestion of dross and impacted soil); and (4) impairment was indicated in the Licking River and Shawnee Run.

<b>Table 1</b> <b>Maximum Contaminant Concentrations</b> <b>2004 Phase II Data</b>						
COC	Dross (mg/kg)	Subsurface Soil (mg/kg)	Surface Soil (mg/kg)	Ground Water (mg/l)	Surface Water (mg/l)	Sediment (m)
Aluminum	229,000	39,000	185,000	<0.2	1.260	
Barium	1720	188	392	0.384	0.0420	
Cadmium	12.8	0.91	7.73	<0.01	<0.01	
Chromium	1070	133	356	<0.1	<0.02	
Cyanide	6.01	0.769	1.7	0.0323	<0.01	
Fluoride	1430	189	202	73.1	0.19	
Nickel	473	34.5	188	0.0393	0.0065	
Selenium	46.5	11	42.8	0.116	<0.1	
Zinc	4370	517	2360	0.0632	<0.02	
Lead	2040	NS	NS	NS	NS	
Ammonia	1030	1400	56.9	2700	2.24	
Nitrogen	220	950	65	75.1	2.45	
Dioxin	.004855*					

NS=Not Sampled  
 \*Total of 10 dioxin congeners detected in one sample at West Pile with total toxic equivalency factor

#### Potential Ecological Effects

Because the high metallic content of the dross may adversely impact sediment-dwelling organisms, if it enters the river, Ohio EPA utilized the document, Development and Evaluation of C Based Sediment Quality Guidelines for Freshwater Ecosystems (MacDonald et al, 2004) to determine the potential impact to sediments. This document provides consensus-based

effect concentrations" (TEC) and "probable effect concentrations" (PEC) for metals in sediment. The TEC is the concentration in sediment below which harmful effects will not be observed. The PEC is the concentration above which harmful effects are likely to be observed. Therefore, the concentration of metals at or above the PEC indicates the sediment is polluted and would adversely impact organisms. Table 2 summarizes the comparison of concentrations of metals in the dross piles adjacent to the Licking River to the TEC and

Table 2 Sediment Ecological Based Quality Standards for Metals (mg/kg)				
Metal	TEC	PEC	Sediment (2004)	Dross Range**
Cadmium	0.99	4.98	0.574	0.64-12.8
Chromium	43.4	111	39.3	123-523
Copper*	31.6	149	NA	1763-84,600
Lead	35.8	128	NA	234-2040
Mercury*	0.18	1.06	NA	0.2-0.26
Nickel	22.7	48.6	16	63.2-337
Zinc	121	459	155	599-4370
* Copper and mercury were not analyzed in Phase II Investigation; used URS (1999) data.				
**Data from east and south piles, which are adjacent to Licking River				
NA=not analyzed				

As shown in Table 2, the metal concentrations in the dross are much higher than the PEC. Continued erosion of the waste dross will increase the overall metallic concentration in sediment and adversely affect sediment dwelling organisms.

#### Licking River Bank Stabilization Project

In 2004, Ohio EPA noted that the Licking River was beginning to erode into the stockpiled material. The material is not as resistant to erosion as native soil and prior attempts by Newark Processing to stabilize the bank had been breached. In 2005, the Ohio EPA decided to contract with the United States Army Corp of Engineers (USACE) for assistance due to their expertise and constructing stream bank stabilization projects.

Ohio EPA is currently working with USACE concerning the erosion of the dross. A memorandum of understanding was signed between Ohio EPA and USACE on December 14, 2006 and a contract was awarded on March 14, 2007. On April 16, 2007, Ohio EPA provided USACE \$2.8 million for the stabilization project. The project will stabilize about 1,600 feet of river bank. The work will include 1) removal of vegetation, rubble, drift and other debris; 2) placement of approximately 17,000 tons of stone; 3) placement of about 21,000 cubic yards of fill material; and 4) placement of about 6,550 square yards of geotextile fabric in the embankment area.

To commemorate the 37th anniversary of Earth Day, Ohio EPA Director Chris Korleski participated in a media event in Newark with the USACE and the city of Newark on April 20, 2007. Construction is anticipated to begin by August 2007 with a goal of completing the project by early 2008.



Photograph 1: Erosion of the site by the Licking River in 2004.



Photograph 2: Erosion of the site by the Licking River in 2005. Note the partial disappearance of the road as seen in the 2004 photograph.



Photograph 3: Erosion of the site by the Licking River in 2007. Note the disappearance of the monitoring well as seen in the 2005 photograph.



Photograph 4: Media event hosted by Ohio EPA on April 20, 2007.



Photograph 5: Artist's rendition of the river bank once the stabilization project is

Summary date: May 2007

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